

**DEC Human Health Criteria Technical Workgroup  
Meeting #1 Notes  
August 20, 2015**

NOTE: Comments on Notes were provided by A. Kelley and T. Wu

Time of Meeting: 10:00 AM – 4:00 PM

Location of Meeting: 1<sup>st</sup> Floor Conference Room, Anchorage Department of Environmental Conservation (DEC) Office, 555 Cordova St. - Anchorage, AK 99501 and Teleconference

Technical Workgroup for Water Quality Standards HHC Members present in person:

- Dr. Lawrence Duffy, University of Alaska, Anchorage (UAA);
- Nancy Sonafrank, Program Manager, DEC Division of Water (DEC/DOW);
- Dr. Kendra Zamzow, Center for Science in Public Participation (CSP<sup>2</sup>);
- Dr. James Fall, Alaska Department of Fish & Game/ Division of Subsistence (DF&G/ Subsistence); Marylynne Kostick (DF&G/ Subsistence);
- Bret Jokela, Anchorage Water and Wastewater Utility (AWWU);
- Dr. Lori Verbrugge, US Department of Fish & Wildlife (USF&W);
- Alison Kelley, NANA Regional Corporation (NANA);
- Dr. Ali Hamade, Alaska Department of Health & Social Services/ Division of Public Health (DHSS/ DPH)

Technical Workgroup for Water Quality Standards HHC Members present by telephone:

- Dr. Lon Kissinger, US Environmental Protection Agency Region 10 (USEPA R10)
- Michael Opheim, Seldovia Village Tribe (Seldovia); Tracie Merrill, Seldovia; Dr. Ted Wu (DEC-C-Sites)

Interested Parties present in person:

- Michelle Hale, Director, DEC/DOW;
- Earl Crapps, Program Manager, DEC/DOW;
- Michael Rieser, Donlin Gold LLC (Donlin);
- Dr. Elizabeth (Betsy) Nobmann (EDN Nutrition Consulting)

Interested Parties present by telephone:

- Bill Beckwith, USEPA R10;
- Shelly Archer, Analytica Group (Analytica);
- Lincoln Loehr, Stoel Rives LLP
- Robert Napier, Red Dog Mine

Meeting Facilitator: Brock Tabor, DEC/DOW

Meeting Notetaker: Jeanne Swartz, DEC/DOW

Action Items:

Who	Will do What	By (Date)
James Fall/ Marylynn Kostick	<ul style="list-style-type: none"> <li>• Provide graph comparing 90<sup>th</sup> percentile Per Cent Capita Use to SVT 90<sup>th</sup> percentile fish consumption rate (FCR) estimates.</li> <li>• Add sample size (n=?) to graphs comparing Community Surveys to SVT study.</li> </ul>	By Sept. 4
All HHC Workgroup members	Review draft meeting notes and comment	By Sept. 11
All HHC Workgroup members	Review 2000 Methodology, section 4. Exposure (pp 4-1 to 4-29) <a href="http://water.epa.gov/scitech/swguidance/standards/upload/2005_05_06_criteria_humanhealth_method_complete.pdf">http://water.epa.gov/scitech/swguidance/standards/upload/2005_05_06_criteria_humanhealth_method_complete.pdf</a>	By Sept. 29
All HHC Workgroup members	<ul style="list-style-type: none"> <li>• Read literature review and peer review report provided in binders and</li> <li>• Send review/ comments to DEC</li> </ul>	By Sept. 29
Ali Hamade/ Lori Vebrugge	Provide HSS opinion survey and focus group discussion on fish consumption suppression	By Oct. 8

**Agenda for Water Quality Standards HHC Technical Workgroup (HHC Workgroup)  
 Meeting #1 August 21, 2015:**

10:00-10:15 Introductions  
 10:15-10:30 Ground Rules and Expectations  
 10:30-11:15 Introduction to Human Health Criteria (HHC)  
 11:15-11:25 Break  
 11:25-12:00 Introduction to HHC formula

12:00-1:00 Break for Lunch

1:15-2:30 Introduction to fish consumption rates  
 2:30-2:40 Break  
 2:40-3:15 DEC Literature Review  
 3:15-4:00 AD&F Subsistence Data presentation  
 4:00 Adjourn  
 (Regional Concept not covered in this meeting)

**Introductions**

The HHC Workgroup meeting commenced at 10:00. Brock Tabor (Brock) welcomed all the HHC Workgroup members and interested parties and asked for introductions; first from the participants present in person, then from the participants joining the meeting by telephone. DEC Commissioner Larry Hartig was joined by DEC Deputy Commissioner Alice Edwards during the Workgroup Introductions. Commissioner Hartig gave a brief introductory statement

and turned the meeting over to DEC/DOW Director Michelle Hale. Director Hale made two points in her introductory remarks:

- The focus of the HHC Workgroup is a technical workgroup, and the recommendations should have a technical, not political focus.
- The diverse backgrounds of the HHC Workgroup members is a valuable asset to DEC.

Brock returned to his role as meeting moderator.

### **Ground Rules and Expectations**

- Brock conducted the meeting by speaking from a PowerPoint presentation visible to the participants in the Anchorage conference room as well as the participants on the telephone through a GoTo Meeting link. The presentation slides will be posted on the DEC website at <http://dec.alaska.gov/water/FCWQS/HumanHealthCriteriaTechWG.html>.
- Brock began the first section of the meeting by making the statement that the HHC Workgroup was convened in order to provide input to DEC/DOW's task of developing criteria to protect aquatic life and human health from contaminants that can reach humans through consumption of water and aquatic organisms for Alaska.
- The HHC Workgroup will meet four to six times over a time period of eight months, review documents, and develop a summary report that will have both technical and policy components during two subsequent meetings.
- WQS apply to surface fresh and estuarine waters located within state jurisdictional State boundaries
  - State waters include marine waters located within three miles of the state's coastline (state-federal boundary of the continental shelf) – *see map sent as separate document*
  - State WQS do not apply outside state jurisdictional boundaries
- Fish (specifically pelagic-dwelling or anadromous fish) may feed and be exposed to contaminants outside state jurisdiction, complicating how HHC for fish consumption can be determined.

### **Introduction to Human Health Criteria (HHC)**

- Comments submitted in the Triennial Review process call for a revision using updated fish consumption rates and associated criteria with Alaska-specific values.
- Litigation in Washington and Idaho drove the process to adopt HHC; DEC would prefer to adopt criteria without litigation. Additionally, industry has expressed concern that new regulations may be difficult to comply with and may not actually reduce levels of identified toxins.
- These factors make it essential to base HHC on scientifically defensible data; necessitating the participation of the HHC Workgroup.
- The goals of the HHC Rulemaking are to:

- Ensure WQS are protective of human health
  - Apply a regulatory process based on a realistic timeframe
  - Acknowledge technology limitations
- There is an unknown relationship between HHC and the amount of fish people eat – the consumption rate of fish may not be the only factor in ingestion of identified toxins.
- Variables to consider are how to determine the population of concern (high consuming tribal/non-native populations and the average fish consumption of the population.
- Air-transport of pollution may be significant contributor to levels of pollutants in fish; problem with how to account for air pollution in methodology.
- An approach was proposed to find out what are the consumption rate(s) and apply to all chemicals. The CWA divides chemicals into categories and the methodology allows flexibility, so need to determine which chemicals are the drivers and make sure the methodology works for the most important chemicals. There was a question that, if there are only twelve chemicals important to HHC, why are 96 chemicals identified?
- Marine mammals may also be a source of ingestion of identified toxins – the HHC Workgroup should consider this possibility.
- Tasks to be considered by the HHC Workgroup include determine and compile the available information about fish consumption and fish consumption rates.
- DEC's options for developing criteria:
  - Statewide
  - Regional
  - Site specific
- Is a probabilistic or a deterministic modeling approach more appropriate? This may be more obvious after reviewing the presentation of ID, Florida, WA modeling approach in October meeting.
- What is the appropriate level of protection for Alaskan residents?
- Bioconcentration vs bioaccumulation – two separate factors
  - Bioaccumulation factor (BAF) is the ratio of concentration of a pollutant in fish tissue from food and water exposure compared to the concentration of the same pollutant in water.
  - Bioconcentration accounts for pollutants in fish tissue from water exposure only.
  - Do some regions of Alaska need BAF that accounts for an additional trophic level exposure from consumption of marine mammals.
- Question for consideration -What is the relative carcinogenic risk factor of fish consumption, given Alaska's small population?
  - Alaska has adopted a carcinogenic substances risk level of 1:100,000 additional occurrences of cancer
    - According to USEPA's guidance, the risk level must be less than 1:10,000 additional occurrences of cancer for high risk populations.
    - How should Alaska address risk from multiple/cumulative contaminants?
- Need to address non-carcinogenic contaminants and nonlinear low dose extrapolation equations as well (Wu)

- If Alaska takes a species-specific approach to FCR, what species should Alaska include to derive HHC and what data would be needed to support such a decision?
  - How should salmon be addressed since majority of time is spent in marine waters
- For Relative Source Contribution (RSC), what options are available for Alaska? EPA allows states to determine appropriate RSC values from 0.2 to 0.8
- A pollutant specific RSC may be needed for Mercury, based on the isotope ratios found in fish (Duffy).
- DHSS/DPH fish consumption studies will be an important reference. From DEC's literature review, there are some other studies, such as the Seldovia Fish Study, that will also be available as references in some regions.
- The HHC may not be adjusted for beneficial aspects of including fish as part of a dietary staple, since the goal of HHC is to prevent contaminants from entering the water and limiting fish consumption.

### **Introduction to HHC formula**

- The HHC Workgroup received a link to the USEPA HHC formula and discussed the policy options states have for setting the degree of acceptable risk of from  $10^{-4}$  to  $10^{-6}$  incremental cancer incidents.
- If all of the estimated values going into a response curve are based on conservative values, then the resultant response curve is going to have an inherent compounded conservatism.
- The Risk-specific dose (RSD) for carcinogens based on a linear low-dose extrapolation (mg/kg-day) need expansion as there are several parameters used in setting the target risk that should be thought about as it will influence the final number (Wu)
- The probabilistic methodology uses a Monte Carlo approach and may be more scientifically defensible. Florida's development of HHC used a probabilistic approach and also used a percentage of lipids in their studies.
- USEPA attempts to get a perspective that is not overly conservative, but does not represent too great a risk.
- Exposure considers the magnitude, frequency and duration of exposure to a particular agent over time.
- USEPA considers BAF from aquatic organisms from trophic levels 2, 3, and 4; mammals may be considered trophic level 5.
- Alaskans may have a higher average body weight than 80 kg, but we may not have access to studies of Alaskans' body weight.
- For age-sensitive factors, USEPA has guidelines to assess risks for vulnerable populations, or studies can be used to supplement information.

**Public comments on morning session:**

Opheim (Seldovia): What is the probabilistic formula?

DEC Response: We will be looking at a range of values derived from various inputs to the HHC formula, instead of specific values for HHC.

Nobmann (EDN Consulting): How is success measured for deterministic and probabilistic formulas?

DEC Response: It depends on which part of the HHC equation is being evaluated.

**(Lunch Break)**

**Introduction to HHC formula – continued**

- It is common practice for states to develop HHC values based on local data
- Basic assumptions:
  - Use local data for freshwater/ estuarine species and use uncooked weight intake values. Anything added during cooking process is not considered
- Consumers (of fish) vs. Non consumers
  - Some members of a population do not eat fish – these are non-consumers. To avoid skewing data, when including non-consumers, base consumption rates on 90<sup>th</sup> or 95<sup>th</sup> percentile value of all consumers. Can use mean value, only if non-consumers are screened out
- Species of fish living and feeding outside state jurisdictional waters (outside the 3-mile maritime limit) may be considered in the relative source category
- Questions to consider:
  - Are some species, i.e. salmon bioconcentrating pollutants?
  - For farm-raised species in state jurisdictional waters, is the food web polluted?
- USEPA incorporates uncertainty into the base reference dose (RfD) value
- HHC Workgroup can use an across-the board RSC of 20-80% if salmon is included and avoid a contaminant-by-contaminant approach. Alternatively, contaminant-specific RSC would be estimated by putting contaminants into categories
  - Contaminant-specific RSC calculations could be a lot of work, even if it is more precise
- RSC, as it stands, is policy-driven, e.g. put salmon in one category and consider separately
- For RSC factors, e.g. marine mammals, where the level of contaminants is known to be high; may consider as a separate category
  - There are changes in contaminant levels of marine mammals as they migrate; should consider because size of state is large
  - Parking lot issue? DEC may need to consider the role of marine mammals even if only on a regional basis.

### Introduction to fish consumption rates



- Whether to rely on tribal or non-tribal surveys may be an initial decision for the group; there are not many fish consumption surveys of either
- Looking at data from other states' populations, e.g. Washington State, may be the best way to make the determination.
- It is only relevant to distinguish different population groups if it can be shown that a given population consumes fish at a higher rate than the general population?
- USEPA - states modeled fish consumption data by using short-term voluntary recall dietary surveys.
- Suppression Effect - artificially diminished level of consumption from an appropriate baseline level of consumption for that subpopulation because of a perception that fish are contaminated with pollutants
  - In the DHSS fish consumption study, focus groups were anti-suppression, proud of their fish consumption. Fear of fish consumption is a perception fostered by outside influences
  - The perception of contaminated fish can lead to lower consumption rates and higher criteria, so that the environment is locked into a degraded state. (Kissinger)
  - When evaluating surveys, suppression effect needs to be considered.
- Fish Consumption Rate (FCR) Surveys
  - Seldovia study was a frequency questionnaire that began with a 24-hour recall
    - The 24-hour Dietary Recall was a quality control measure on the long-term questionnaire
    - If participants didn't have answers to the survey questions, the survey was used as a gauge
  - A problem with short-term surveys is that they miss consumption of fish regularly consumed, however data restraints with Food Frequency Questionnaires make them hard to work with
  - Modeling may be used at different points in developing an FCR – this issue will be developed in a later HHC Workgroup meeting focusing on deterministic and probabilistic modeling.

## **DEC Literature Review**

- All, except one in the FCR studies, included surveyed fish consumers only
  - The studies surveyed harvest and consumption practices, making a distinction between them
  - One of the studies reviewed considered high fish-consuming populations found in Southeast Alaska and in other parts of the state
- The key points from the experts' peer review are as follows:
  - A need to consider Fish and Game (DF&G) Harvest data
  - Potential need to consider sources of food affected by water quality issues other than fish, i.e., seaweed, marine mammals
  - A need to consider data sources from the federal government
  - A need to consider sampling certain high fish-consuming populations separately from the general population
    - Some populations are near the threshold effect levels due to consumption of certain species (marine mammals) and have little or no assimilative capacity (Vebrugge)
    - The Seldovia Tribe members harvest seaweed for consumption and some other populations also harvest seaweed
    - Should other resources be considered, such as seabird eggs? – The focus is on water quality, not all subsistence resources
      - This issue may be relevant to a discussion of regional criteria discussion.
      - Possible to make a criterion that includes other biota, but have to be consistent in determination
    - Parking lot? These issues may be site specific or contaminant specific (e.g. arsenic in seaweed).
- Next steps for Literature Review
  - Make documents available to the general public
  - Post on website, notify stakeholders
  - Present at Statewide HHC Workshop
  - Engage with F&G and USFW Subsistence staff to identify additional sources of information
- Kodiak tribe is in the process of conducting a FCR
- This area (FCR studies) is outside of DEC's ordinary expertise; will take time to find, assess, and incorporate information.

## **AD&F Subsistence Data presentation – by Dr. James Fall and Marylynn Kostick**

- ADF&G collects harvest data from: commercial, sport, personal use, and subsistence fisheries – includes information on local demographics and economies, and description of data collection methods
- Methodologies convert harvest data to consumption rate estimates

- The Division of Subsistence's (ADF&G-Subsistence) goal is to develop a holistic understanding of a mixed economy (subsistence and commercial)
- ADF&G – Subsistence's projects are partnership projects with other organizations
- Information is gathered by face-to-face interviews in homes
- Participants are asked about specific harvest and consumption practices and also asked to compare each to the previous year
- Information about ADF&G- Subsistence's projects can be found online at:  
<http://www.adfg.alaska.gov/sb/CSIS/>
- 269 out of 355 participants are rural
- 450 datasets collected per year
- Most information about harvests reported in usable weights
- 438 lbs/person/year (199,000 grams/person/year, or 545 grams/person/day) was the highest amount reported and 17 lbs/person/year (7,700 grams/person/year, or 21 grams/person/day) was the lowest reported
  - Question: How is consumption by children factored in since their body burden is different than that of an adult
- Data collected is not age-specific
- The Mean Value Per Capita Harvest is calculated: Total Harvest/Community Population
- The Mean Value Per Capita Use is calculated: Mean Value Per Capita Harvest/ Per Cent Households Using Resources
- The intent is to capture cultural use patterns
- 95<sup>th</sup> percentile Per Capita Use is an estimate of high-end use in the community
- Communities are divided into three groups: No Sharing, All Sharing, and No Use households
- Technical paper No. 261 describes this process
- Seldovia FCR project converts estimates of harvest into usable weights
  - The pattern of use in Seldovia is similar to that in the nearby village of Nanwalek, but dissimilar to FCR of Tyonek survey data

(End of ADF&G Presentation - Brock returned to his role as meeting moderator)

The discussion on Regional Concepts was tabled to discuss in another HHC Workgroup meeting, but DEC will be providing information and updates on this topic to HHC Workgroup members

**Public comments on afternoon session:**

Loehr (Stoel Rives): Will new water quality standards related to HHC determinations be applied after the mixing zone? Concerned that CWA remedies to HHC concerns are overprotective, burdensome for industry, and do not have desired effects

Loehr: National Oceanic and Atmospheric Agency (NOAA) looked at fish consumption after Exxon Valdez spill and found that polycyclic aromatic hydrocarbon (PAH) risk in smoked fish was significant.

Nobmann (EDN Consulting): Older studies on dietary information exist, but only in hard copy.

Kelley (NANA): In the March 29 draft of the literature review, the peer reviewer found the 2000 methodology for deriving the HHC formula

Hale (DEC/DOW): Each meeting following this one will begin with a review of the previous meeting and look ahead to the next meeting

## NEXT MEETING

### Technical Workgroup Meeting #2 (September 30, 2015)

- Review of HHC issues and meeting schedule
- **Recap Issue #1: What information about fish consumption rate is available to inform the HHC process?**
  - Workgroup Recommendations
- **Issue #3 (part one) – What is the appropriate Level of Protection for Alaska to consider?**
  - FCR: Consumers v. Non-consumer
  - FCR: General v. Highly Exposed population(s)
  - Other Exposure factors (drinking water intake, body weight, relative source contribution)
  - Approaches used by other states